

REMARKS

Applicants respectfully request reconsideration of the above-captioned application. Claims 1-6 and 16-25 are currently pending. Claims 1 and 18 have been amended for clarity. Accordingly, entry is respectfully requested.

Claim Rejections – 35 U.S.C. §102

Claims 1-2, 16-19, and 22-23 have been rejected under 35 U.S.C. §102(b) as being allegedly anticipated by Nakatani (US Patent 6,008,576). Applicants respectfully disagree.

Exemplary embodiments of the present invention disclose a FED including a gate insulating layer having a well and a gate electrode having a cylindrical electrode part. A single electron emitter is positioned in the well and an electron beam emitted from the electron emitter is focused by an electric lens, wherein the electric lens is generated by the cylindrical part of the gate electrode upon application of an electric field thereto. The electric lens is substantially axisymmetric with respect to the central axis of the electron beam, as shown in FIGS. 5, so that the electron beam is focused toward the central axis thereby the beam radius is decreased (FIG. 8).

Applicants respectfully submit that the presently claimed invention is not anticipated by the applied art. First, it appears that the Office has viewed the bumps in the gate electrode caused by the emitter electrode metal film 3b as the recited "cylindrical electrode part" of the claims. This cannot be the case insofar as, if this portion of the electrode layer had a focusing effect, it would cause unbalanced focusing since these bumps are quite a bit more distant from some of the emitters than others. In marked contrast, as discussed above, the cylindrical part of the

presently claimed invention forms an electric lens that is axisymmetric with respect to an electron beam emitted from a single electron emitter. Second, the Nakatani system has a different structure than the present embodiments. In the Nakatani system, the bump portion of the gate electrode 2a surrounds a plurality of electron emitters in an array format. In contrast, the cylindrical part of the presently claimed invention is associated with and surrounds only one electron emitter. Third, as shown in FIG. 3 of the Nakatani patent, two neighboring electron emitters are separated by a flat gate electrode. In fact, the gate electrode adjacent the tip of each electron emitter is flat, as shown in FIGS. 2-5 of the Nakatani patent, which will generate the electron beam defocused thereby increasing the size of a spot formed on the fluorescent layer 8 (page 2, l. 27-31). The cited reference is silent as to how the bump portion of the gate electrode layer would create a focusing effect to reduce the spot sizes of a plurality of electron emitters surrounded thereby. Stated differently, the bumps would not meet the recitation of forming "a focusing electric field from the gate hole toward a proceeding path of an electron beam."

To clarify the distinctions over the cited reference, claim 1 has been amended to include "wherein said focusing electric field is axisymmetric with respect to a central axis of the electron beam." Likewise, claim 18 has been amended to include "wherein said electric lens is axisymmetric with respect to a central axis of the electron beam." Support for the changes can be found in FIGS. 5 and 8, and the text related thereto, for instance. The cited reference is silent as to these recitations.

In light of the foregoing, Applicants respectfully submit that claims 1 and 18 are not anticipated by the cited reference, and claims 1 and 18 are allowable. Claims 2, 16, and 17 depend from claim 1, rendering them also patentable for at

least the same reasons. Likewise, claims 19 and 22-23 depend from claim 18, rendering them also patentable for at least the same reasons. While additional distinctions found in the dependent claims will not be belabored, it is noted in passing that the undersigned could not locate a bellmouse shaped gate electrode in the Nakatani system, for example.

Claim Rejections – 35 U.S.C. §103(a)

Claims 3-4 and 20-21 have been rejected under 35 U.S.C. §103(a) as being allegedly unpatentable over Nakatani (US 6,008,576) in view of Hsu (US 6,448,701).

The Hsu patent does not cure, nor is it purported to cure, the deficiencies of the rejection noted above. Accordingly, Applicants respectfully submit that the rejection of claims 3-4 and 20-21 are patentable for at least the same reasons.

Claims 5-6 and 24-25 have been rejected under 35 U.S.C. §103(a) as being allegedly unpatentable over Nakatani (US 6,008,576) in view of Cade (US 5,942,849).

Again, this rejection is predicated in a contested characterization of the Nakatani patent, and is respectfully traversed, as pointed out above. Accordingly, Applicants respectfully submit that the rejection of claims 5-6 and 24-25 should be withdrawn.

Conclusion

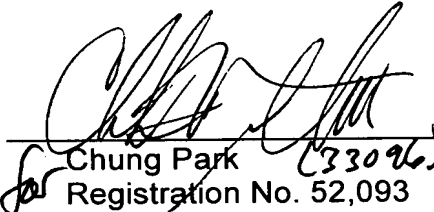
Based on the reasons as set forth above, Applicants respectfully request allowance of all pending claims.

In the event that there are any questions concerning this paper, or the application in general, the Examiner is respectfully urged to telephone Applicants' undersigned representative so that prosecution of the application may be expedited.

Respectfully submitted,

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